

Interactive comment on “CCN activity of organic aerosols observed downwind of urban emissions during CARES” by F. Mei et al.

Anonymous Referee #1

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Mei et al. consider the nucleation of droplets (using a CCNC) from a size selected fraction of the atmospheric aerosol (using a DMA) and compare this to aerosol chemistry using an AMS instrument at a remote California field site. Mei et al. derive the compositional parameter k , which is rather low compared to past continental studies, and show this is likely due to the high organic fraction of the aerosol at this location. The values, while somewhat lower than typical continental, are comparable to studies in similar areas (chemistry) and this should help the field to better understand that these low k values are common.

The paper is well written and it is an excellent addition to this special issues on CARES. I have a few points I hope the authors will consider.

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1. I found the maximum value of only 0.9 (90% of particles activated) at 108 nm in Figure 3 a bit surprising at the highest supersaturations ($\sim 0.8\%$). Would not even particles of this size with minimal soluble material activate at this supersaturation? Can the authors include the activation RH required for insoluble particle of this size for comparison? 2. It is not clear what additional information is provided in panels (b) and (c) of figure 1 (don't they essentially repeat concentration with the only difference being density)? 3. This manuscript requires more careful editing. There are several grammatical mistakes. E.g. 9379 “suggesting (the) vast majority” as one example. 4. My major concern is that the paper, especially the Results section, is too AMS-centric and, as a result, is rather too long. What I mean by this is that there is excessive detail spent on e.g. O:C ratio and fraction of signal in mass 44 peak. While this is likely of interest to the AMS user it is not an atmospheric quantity (rather these are instrumental outputs, not results). The Results section could consequently be shortened a great deal by concentrating on the important compositional trend impact on the hygroscopicity parameter k . The amount of detail in O:C ratio and f44 can be moved to the supplementary material where an interested user can find it. Figures 7 and 8 don't really add much information to the non-AMS user and can be moved to supplementary materials as well. Again, this detail is something that should be presented at a users meeting, not the scientific section of the paper. It detracts from the real message.

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